

CLAIMS

What is claimed is:

- 1 1. A method for designing a system on a target device utilizing programmable logic
2 devices (PLDs), comprising:
3 generating options for utilizing resources on the PLDs in response to user specified
4 constraints; and
5 refining the options for utilizing the resources on the PLDs independent of the user
6 specified constraints.
- 1 2. The method of Claim 1, wherein refining the options for utilizing the resources is
2 performed in response to the options not satisfying design parameters.
- 1 3. The method of Claim 1, wherein refining the options for utilizing the resources is
2 performed in response to the options not satisfying the user specified constraints.
- 1 4. The method of Claim 1, wherein refining the options for utilizing the resources is
2 performed in response to having a threshold number of options generated.
- 1 5. The method of Claim 1, wherein refining the options for utilizing the resources is
2 performed in response to a triggering event.
- 1 6. The method of Claim 1, wherein generating options for utilizing the resources on the
2 target device comprises determining locations to place components within user-defined logic
3 regions on the target device.

1 7. The method of Claim 6, wherein determining positions to place the components is an
2 iterative procedure that includes:
3 selecting locations;
4 evaluating the locations with a cost function; and
5 accepting the locations if the cost function yields a desired value.

1 8. The method of Claim 6, wherein refining the options for utilizing the resources on the
2 target device independent of the user specified constraints comprises determining locations to
3 place the components on the target device by removing constraints associated with the user-
4 defined logic regions.

1 9. The method of Claim 1, wherein generating options for utilizing the resources on the
2 target device comprises determining routing resources to allocate to user specified signals on the
3 target device in response to user specified routing constraints.

1 10. The method of Claim 9, wherein determining routing resources is an iterative
2 procedure that includes:
3 selecting routing resources;
4 determining whether routing resource selections satisfy the user specified routing
5 constraints; and
6 re-selecting routing resources if the routing resource selections do not satisfy the user
7 specified routing constraints.

1 11. The method of Claim 9, wherein refining the options for utilizing the resources on
2 the PLD independent of the user specified constraints comprises determining routing resources to

3 allocate to the user specified signals on the PLD by removing the user specified routing
4 constraints.

1 12. A method for positioning components of a system onto a target device utilizing
2 programmable logic devices (PLDs), comprising:
3 determining possible locations to place a user defined logic region on a target device;
4 determining possible locations to place a component in response to constraints associated
5 with the user defined logic region; and
6 determining possible locations to move the component from the possible locations to
7 place the component independent of the constraints associated with the user defined logic region.

1 13. The method of Claim 12, wherein determining the possible locations to place the
2 user defined logic region comprises:
3 assigning an initial location for the user defined logic region;
4 moving the user defined logic region to a new location; and
5 evaluating a cost function associated with the user defined logic region in the new
6 location.

1 14. The method of Claim 13, wherein evaluating the cost function comprises:
2 determining a timing of the system associated with the user defined logic region in the
3 new location; and
4 determining routing resources requirements associated with the user defined logic region
5 in the new location.

1 15. The method of Claim 12, wherein determining possible locations to place the
2 component comprises:

3 assigning an initial location for the component in the user defined logic region; and
4 evaluating a cost function as the user defined logic region and the component are moved.

1 16. The method of Claim 12, wherein determining possible locations to move the
2 component from the possible locations to place the component independent of the constraints
3 associated with the user defined logic region is performed in response to the possible locations to
4 place the user defined logic region and the component not satisfying design parameters.

1 17. The method of Claim 12, wherein determining possible locations to move the
2 component from the possible locations to place the component independent of the constraints
3 associated with the user defined logic region is performed in response to the possible locations to
4 place the user defined logic region and the component not satisfying user specified constraints.

1 18. The method of Claim 12, wherein determining possible locations to move the
2 component from the possible locations to place the component independent of the constraints
3 associated with the user defined logic region is performed in response to having a threshold
4 number of possible locations determined.

1 19. A method for designing a system on programmable logic devices (PLDs),
2 comprising:
3 determining routing strategies for routing signals on the PLDs in response to user
4 specified routing constraints; and
5 determining additional routing strategies for routing the signals on the PLDs independent
6 of the user specified routing constraints.

1 20. The method of Claim 19, wherein determining routing strategies for routing the
2 signals on the PLDs in response to user specified routing constraints comprises:
3 selecting routing resources for a user specified signal on the PLDs in response to the user
4 specified routing constraints; and
5 selecting routing resources for a non-user specified signal on the PLDs without utilizing
6 the user specified routing constraints.

1 21. The method of Claim 19, wherein determining additional routing strategies for
2 routing the signals comprises selecting routing resources for the user specified signal on the PLDs
3 independent of the user specified routing constraints.

1 22. The method of Claim 19, wherein determining additional routing strategies for
2 routing the signals is performed in response to the routing strategies not satisfying user specified
3 routing constraints.

1 23. The method of Claim 19, wherein determining additional routing strategies for
2 routing the signals is performed in response to the routing strategies not satisfying design
3 parameters.

1 24. The method of Claim 19, wherein determining additional routing strategies for
2 routing the signals is performed in response to a threshold number of routing strategies being
3 determined.

1 25. A machine-readable medium having stored thereon sequences of instructions, the
2 sequences of instructions including instructions which, when executed by a processor, causes the
3 processor to perform:

4 generating options for utilizing resources on programmable logic devices (PLDs) in
5 response to user specified constraints; and
6 refining the options for utilizing the resources on the PLD independent of the user
7 specified constraints.

1 26. The machine-readable medium of Claim 25, wherein refining the options for
2 utilizing the resources is performed in response to the options not satisfying design parameters.

1 27. The machine-readable medium of Claim 25; wherein refining the options for
2 utilizing the resources is performed in response to the options not satisfying the user specified
3 constraints.

1 28. The machine-readable medium of Claim 25, wherein refining the options for
2 utilizing the resources is performed in response to having a threshold number of options
3 generated.

1 29. The machine-readable medium of Claim 25, wherein refining the options for
2 utilizing the resources is performed in response to a triggering event.

1 30. The machine-readable medium of Claim 25, wherein generating options for utilizing
2 the resources on the target device comprises determining locations to place components within
3 user-defined logic regions on the target device.

1 31. The machine-readable medium of Claim 30, wherein refining the options for
2 utilizing the resources on the target device by ignoring the user specified constraints comprises

3 determining locations to place the components on the target device by removing constraints
4 associated with the user-defined logic regions.

1 32. The machine-readable medium of Claim 25, wherein generating options for utilizing
2 the resources on the target device comprises determining routing resources to allocate to user
3 specified signals on the target device in response to user specified routing constraints.

1 33. The machine-readable medium of Claim 32, wherein refining the options for
2 utilizing the resources on the PLD by ignoring the user specified constraints comprises
3 determining routing resources to allocate to the user specified signals on the PLD by removing
4 the user specified routing constraints.